



Introduction to Ecologically Unequal Exchange in Comparative Perspective¹

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Ecologically unequal exchange (EUE) is generally understood as the unequal material exchange relations among countries holding different positions in the world-system. Proponents of this perspective center attention on the harms created in the process of withdrawing energy and other resources from less developed countries (and regions) by developed countries (and regions) and the export of hazardous production and waste disposal activities from the developed to the less

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developed countries. Such relations not only damage the environment, but they have adverse health, safety, and socio-economic consequences for the human populations of less developed countries and they represent a form of environmental injustice and a legacy of ecological debt. Less developed countries are particularly vulnerable to the risks posed by material withdrawals and hazardous exports because less developed states and domestic firms have limited means for or interest in managing risks and many workers and citizens are often unaware of the risks associated with these hazards. EUE relations are also a source of many environmental distribution conflicts throughout the world-system.

EUE continues to be a vibrant area of scholarship within world-systems analysis. Its origins can be traced to the work of Stephen Bunker (1984, 1985, 2005; Bunker and Ciccantell 2005). Bunker introduced the idea of ecologically unequal exchange by building on earlier structural analyses of unequal economic exchange, including those by Latin American economists Raúl Prebisch and Celso Furtado within the UN Commission for Latin America and the Caribbean, as well as the critical analyses of unequal economic exchange by Arghiri Emmanuel (1972) and Samir Amin (1976). Interest in ecologically unequal exchange has grown over the past decade as witnessed by the publication of several collections (Jorgenson and Clark 2009; Hornborg and Martinez-Alier 2016) and important contributions by Foster and Holleman (2014), Hornborg (1998, 2011, 2015), and Jorgenson (2016a, 2016b). We add to and extend this literature by including articles that explore various qualitative, quantitative, and evaluative dimensions of ecologically unequal exchange in the contemporary world-system.

The Contributions: Quantitative, Qualitative, and Evaluative

This special issue of the *Journal of World-Systems Research* presents six articles that were (with one exception, Henderson and Shorette) first presented at the *Conference on Ecologically Unequal Exchange: Environmental Injustice in Comparative and Historical Perspective* organized by the co-editors at the University of Tennessee, Knoxville on October 15-16, 2015. Additional papers from the conference will appear in a forthcoming book to be published by Palgrave-Macmillan in early 2018 (Frey, Gellert, and Dahms forthcoming). This set of articles provides quantitative and qualitative work that builds on the EUE literature and also pushes the boundaries of EUE work in productive ways, ending with an article evaluating the relevance of the EUE frame to contemporary climate change negotiations.

Three quantitative contributions highlight the increasing scope and depth of the impact of ecologically unequal exchange on the world's environment. They also advance our knowledge and perspectives on EUE in novel directions. We begin with Mark Noble's addition to this stream of literature that has come to be shaped by Andrew Jorgenson (2016a, 2016b) and his students and colleagues. He uses the case of cacao production and the adverse environmental consequences of

unequal ecological exchange relations between core and peripheral countries. Extending the scholarship on the effects of EUE on environmental degradation and specifically deforestation, Noble hones in on the temporal effects of cacao production on deforestation for samples of less-developed countries engaged in cacao production. He demonstrates not just that there *is* an effect, but that the effects are *increasing*. This increase, moreover, is attributed to the spatial expansion of cacao production, a geographical extensification that investors and producers find cheaper than investments in intensification or expansion via historical practices of growing cacao in the shade of more ecologically complex forest landscapes.

Kent Henderson and Kristen Shorette note that core-based resource extraction from peripheral nations disproportionately benefits core nations, but seeking to integrate world society and world-systems approaches, they argue that a “global environmental regime” has emerged as an important feature of the contemporary world-system. Moreover, they posit that this regime tempers the negative effects of EUE with its positive environmental consequences, as stronger ties to global institutions create more positive environmental outcomes in the periphery. They add a methodological nuance to much quantitative research that they believe swamps out the positive effects of global institutions by including most countries in the global South. Instead, in their case study of palm oil production and its relationship to deforestation, they analyze a small sample of 15 palm oil exporting states. Based on unbalanced panels of these states for the period from 1990 to 2012, they find that stronger national embeddedness in the world society through citizen memberships in INGOs is associated with greater primary forest area, and the pattern holds even for Indonesia and Malaysia—two countries that produce palm oil at a much higher rate than the other producers included in the analysis. The authors clearly demonstrate “the variable importance of national embeddedness into global institutions within the periphery” in reducing forest loss under conditions of unequal ecological relations.

John Bradford and Alex Stoner’s study of the effects of military spending on per capita carbon emissions across the period of 1960-2014 in a series of cross-sectional and panel analyses is a substantial contribution to the existing literature. They extend prior studies of military expenditures and demonstrate the existence of an “enduring relationship between militarism and carbon emissions in cross-sectional comparisons. . . . [that has become stronger in recent decades].” They find that economic level moderates the effect of military spending, with military expenditures having a greater relative (and net effect) on emissions in more economically affluent countries and the effect of military expenditures becoming greater after the 1990s. In sum, economically powerful and militarily strong nations displace environmental bads to the global commons and the peripheral zones of the world-system. In a world-system that is built in part on geopolitical competition and military prowess, the ecological implications of attempting “ascent” are thus clear.

Qualitative research allows us to unpack the usually more local and regional nuances of the effects of relations of unequal ecological exchange. While the quantitative studies demonstrate different dimensions of the continued macro-level deleterious effects of EUE (potentially tempered by global institutions), the two qualitative case studies included in this issue dig deeper into the adverse environmental and socio-economic consequences of unequal exchange relations in Uganda and India, respectively. Kelly Austin identifies the mechanisms that underlie unequal exchange relations between core and periphery by focusing on the perspectives and experiences of coffee growers in Uganda. She presents an intriguing case study examining the environmental and socio-economic consequences of coffee cultivation in Bududa, a rural area located in the eastern part of Uganda. Bududa supplies a large proportion of the coffee marketed to consumers in the core. Interviews with coffee cultivators indicated that the coffee economy has adverse effects on gender relations, health, deforestation, and overall economic conditions. Austin concludes that “there are some material benefits from cultivating and selling coffee beans, but a lack of long-term economic stability for households and the consequences for the status of women, health of the community, and the local environment calls into question the efficacy of coffee production as a viable development scheme that significantly enhances overall community well-being.”

Raja Swamy examines the relationship between humanitarian aid and EUE as related to the post-disaster reconstruction efforts in India's Tamil Nadu state following the 2004 Indian Ocean tsunami. He examines how the humanitarian “gift” of housing by NGOs played an important role in the state's efforts to displace fishers to inland areas, allowing the state to grab coastal lands for various development projects such as ports, infrastructure, industries, and tourism. The humanitarian “gift” depoliticized critical issues of land, resources, and livelihood that were the source of long-standing political conflicts between local fishers and the state. Differing significantly from Henderson and Shorette’s argument that global institutions can help sustain peripheral environments, Swamy finds that fishers were displaced and “underdeveloped by reconstruction” via an uncomfortable alliance of a developmental state and well-intentioned NGOs. Swamy concludes,

...humanitarian aid, despite its associations with benevolence and generosity, presents a troubling and disempowering set of options for political struggles over land, resources, and social entitlements such as housing, thereby intensifying existing ecological and economic inequalities.

The difference in perspective may be attributed to the still macro-sociological perspective of Henderson and Shorette and the anthropological perspective of Swamy, but it also reminds us to pay attention to the risks of overgeneralizing either the benefits or harms of global institutions.

In the last paper in this collection, David Ciplet and Timmons Roberts analyze the ways in which the global South is “splintering.” They take to task the classic world-systems perspective, or better-said dependency perspective, for dividing the world into a small group of rich countries and a large group of poor, peripheral, and dependent ones. Ciplet and Roberts present rich insights into the series of Conference of Parties (COP) meetings and how they have unraveled due to the splintering of previously unified global South representatives.

As they point out, the EUE discourse becomes more difficult to maintain as a result. Their argument is well-taken, although we are left wondering about two things. First, Wallerstein (1976) was emphatic from the start about the role of the semi-periphery in legitimizing the structures of inequality in the world-system by holding up the ‘developmentalist illusion’ (Arrighi and Drangel 1986; see also Wallerstein 1991). Later, others have noted that the semi-periphery is characterized by authoritarian political systems. The developmental states of the 1980s and 1990s, including the bureaucratic authoritarian industrializing regime of South Korea (Cumings 1989), are earlier examples of the kinds of ironies that Ciplet and Roberts illustrate in more recent years in India and South Africa. Second, by demonstrating the multiple ‘splinters’ and infighting in the global South, they appear to risk an analysis that overemphasizes diversity in the periphery (even at one point referring to a modernization theory like “continuum” of states). To be sure, like the competition among peripheral producers of all kinds, the structure and ideology of the world-system create a world in which it appears that there is a competitive continuum, in this case of those not only striving to ‘develop’ but also to avoid the deleterious consequences of climate change literally lapping on their shores. And, Ciplet and Roberts remind us that politics matters while the core countries continue to triumph over the periphery with the help and legitimation of the semi-periphery. Since ecological debt (the approach taken by Hornborg and Martinez-Alier 2016 in their recent special issue) faces serious political obstacles, the problem remains of how to create a unified movement for socio-ecological justice (see Martinez-Alier et al. 2016; Smith et al. 2016).

Hidden Debates

Beneath the surface of these six articles is a debate or more accurately a “nondebate” (Arrighi 1998) between the ‘metabolic rift’ (Foster 1999, 2000; Foster et al. 2010) and the ‘world-ecology’ (Moore 2011, 2015) perspectives. The metabolic rift perspective has led to the production of a stream of literature on the ecological crises induced by the national and global expansion of capitalism (Clark and Foster 2009; see the detailed bibliography on the metabolic rift at www.monthlyreview.org/commentary/metabolic-rift). This literature serves as a theoretical foundation for and meshes well with ‘ecological footprint’ studies pioneered by York et al. (2003, 2009; see also Jorgenson and Clark 2009, 2012). Due to a combination of the data that is used and the relative acceptance of the ontological separation of humans from ‘their’ environment, these

studies do not take on the ontological challenge of a dialectical understanding of socio-nature or “humans-in-nature.”

In contrast to this tradition, Moore and the network of world-ecology scholars (see <https://worldecologynetwork.wordpress.com/>) encourage us to entertain the simultaneity of humans in/of nature. In this effort, Moore (2000, 2011) for several years attempted to debate John Bellamy Foster and his colleagues. When they at last took up the challenge, the venom perhaps overshadowed the insights that such a debate hoped to facilitate. In brief, Foster defends metabolic rift as deeply and truly dialectical (Foster and Burkett 2000; Foster and Holleman 2014; Longo et al. 2015), while Moore (2011, 2015:75ff.) insists on his ontological critique that their approach separates out and “adds up” the effects of humans on a putatively separate nature. This debate was taken up vociferously at our conference at the University of Tennessee, but remains unresolved by the contributions included here.

Future Directions, or What Is Needed in Ecologically Unequal Exchange Research

In a series of contributions, Wallerstein (1991, 1996) identified world-systems research as “undisciplinary” and called on social scientists to revisit and rethink the 19th century intellectual fetters on our creativity. Unlike multidisciplinary, unidisciplinarity means that we not only include quantitative and qualitative methods from various disciplinary foundations, but we strive to unify them. Yet, achieving unidisciplinarity is obviously not easy, in many regards, and may well be beyond our grasp. Thus, the contributions here demonstrate the continuing challenge of integrating different approaches and disciplines. As noted above, quantitative research is, with increasing precision and sophistication, continuing to measure the effects of ecologically unequal exchange via cross-national research, while qualitative research unpacks the usually more local and regional nuances of these effects. Like other quantitative world-systems research, quantitative studies in EUE research rely on nationally produced statistics, the quality of which is often questionable, especially in the African states (Jerven 2013). As a result, we run the risk of being lulled into complacency about the precision with which we can measure and evaluate the causal impact of EUE. At the same time, qualitative studies highlight processes and experiences at the raw material starting points of commodity chains that are at one and the same time clearly conditioned by the world-system dynamics of EUE and also manifestations of more idiosyncratic characteristics of the historically-produced cultures and politics, including gender and labor relations. These relations clearly are functional to the expansion of EUE, but are they *necessary*? These qualitative studies, then, run the converse risk of being dismissed as too particularistic.

So, our ambition remains to create a body of work that would adequately address these challenges. And, yet, there are even greater ones, most particularly, the query of Marx’s thesis XI: not just how to understand the world but how to *change* it. As if the methodological, ontological,

and epistemological challenges were not daunting enough, we also need more contributions from and conversations with various actors from across the world. Just as tracing the different kinds of impact of commodity chains across the globe can turn into a futile effort to “keep up” with capitalist financiers and their allied political actors, tracking the negotiations over climate change agreements can lead to limitations in identifying but not fully grasping the multiple struggles over how best to redress EUE in the 21st century world-system. We hope that the contributions here encourage us all, then, to forge onward in our efforts to create an *ecological civilization* (Magdoff 2011) and a more just and sustainable world.

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References

- Amin, Samir. 1976. *Unequal Development: An Essay on the Social Formations of Peripheral Capitalism*. New York: Monthly Review Press.
- Arrighi, Giovanni. 1998. "Capitalism and the Modern World-System: Rethinking the Nondebates of the 1970s." *Review XXI*(1): 113-129.
- Arrighi, Giovanni and Jessica Drangel. 1986. "The Stratification of the World Economy: An Exploration of the Semiperipheral Zone." *Review 10*(1): 9-74.
- Bunker, Stephen G. 1984. "Modes of Extraction, Unequal Exchange, and the Progressive Underdevelopment of an Extreme Periphery: The Brazilian Amazon, 1600-1980." *American Journal of Sociology 89*(5): 1017-1064.
- _____. 1985. *Underdeveloping the Amazon: Extraction, Unequal Exchange, and the Failure of the Modern State*. Chicago, IL: University of Chicago Press.
- _____. 2005. "The Poverty of Resource Extraction." Pp. 211-226 in *New Directions in the Sociology of Global Development*, Vol. 11, Research in Rural Sociology and Development, edited by F. H. Buttel and P. McMichael. New York: Elsevier JAI.
- Bunker, Stephen G. and Ciccantell Paul S. 2005. *Globalization and the Race for Resources*. Baltimore, MD: The Johns Hopkins University Press.
- Clark, Brett and John Bellamy Foster. 2009. "Ecological Imperialism and the Global Metabolic Rift: Unequal Exchange and the Guano/Nitrates Trade." *International Journal of Comparative Sociology 50*(3-4): 311-334.
- Cumings, Bruce. 1989. "The Abortive Abertura: South Korea in the Light of Latin America Experience." *New Left Review I*/173 (January-February): 5-32.
- Emmanuel, Arghiri. 1972. *Unequal Exchange: A Study in the Imperialism of Trade*. New York: Monthly Review Press.
- Foster, John Bellamy. 1999. "Marx's Theory of Metabolic Rift: Classical Foundations for Environmental Sociology." *American Journal of Sociology 105*(2): 366-405.
- _____. 2000. *Marx's Ecology*. New York: Monthly Review Press.
- Foster, John Bellamy, Brett Clark and Richard York. 2010. *The Ecological Rift: Capitalism's War on the Earth*. New York: Monthly Review Press.
- Foster, John Bellamy and Paul Burkett. 2000. "The Dialectic of Organic/Inorganic Relations: Marx and the Hegelian Philosophy of Nature." *Organization & Environment 13*(4): 403-425. doi: 10.1177/1086026600134002.
- Foster, John Bellamy and Hannah Holleman. 2014. "The Theory of Unequal Ecological Exchange: A Marx-Odum Dialectic." *The Journal of Peasant Studies 41*(2): 199-233.

- Frey, R. Scott, Paul K. Gellert, and Harry F. Dahms, editors. Forthcoming, 2018. *Ecologically Unequal Exchange: Environmental Injustice in Comparative and Historical Perspective*. London, UK: Palgrave-Macmillan.
- Hornborg, Alf. 1998. "Ecosystems and World Systems: Accumulation as an Ecological Process." *Journal of World-Systems Research* 4(2): 169-177.
- _____. 2011. *Global Ecology and Unequal Exchange: Fetishism in a Zero-Sum World*. New York: Routledge.
- _____. 2015. "Why Economics Needs to be Distinguished from Physics, and Why Economists Need to Talk to Physicists: A Response to Foster and Holleman." *The Journal of Peasant Studies* 42:187-192.
- Hornborg, Alf and Joan Martinez-Alier, editors. 2016. "Ecologically Unequal Exchange and Ecological Debt." Special issue of *Journal of Political Ecology* 23:328-491.
- Jerven, Morton. 2013. *Poor Numbers: How We Are Misled by African Development Statistics and What to Do About It*. Ithaca, NY: Cornell University Press.
- Jorgenson, Andrew K. and Brett Clark. 2009. "The Economy, Military, and Ecologically Unequal Exchange Relationships in Comparative Perspective: A Panel Study of the Ecological Footprints of Nations, 1975-2000." *Social Problems* 56(4): 621-646.
- Jorgenson, Andrew K. and Brett Clark, editors. 2009. "Ecologically Unequal Exchange in Comparative Perspective." Special issue of the *International Journal of Comparative Sociology* 50(3-4): 1-409.
- Jorgenson, Andrew K. and Brett Clark. 2012. "Are the Economy and the Environment Decoupling? A Comparative International Study, 1960–2005." *American Journal of Sociology* 118(1): 1-44.
- Jorgenson, Andrew K. 2016a. "Environment, Development, and Ecologically Unequal Exchange." *Sustainability* 8(3): 227 doi:10.3390/su8030227
- _____. 2016b. "The Sociology of Ecologically Unequal Exchange: Foreign Investment and Environmental Load Displacement: Summary of the Literature and Implications for Sustainability." *Journal of Political Ecology* 23: 334-349.
- Longo, Stefano B., Rebecca Clausen, and Brett Clark. 2015. *The Tragedy of the Commodity: Oceans, Fisheries, and Aquaculture*. Rutgers, NJ: Rutgers University Press.
- Magdoff, Fred. 2011. "Ecological Civilization." *Monthly Review* 62(8): 1-25.
- Marley, Benjamin J. 2015. "The Coal Crisis in Appalachia: Agrarian Transformation, Commodity Frontiers and the Geographies of Capital." *Journal of Agrarian Change* 16(2): 225-254. doi: 10.1111/joac.12104.
- Martinez-Alier, Joan, Leah Temper, Daniela Del Bene, and Arnim Scheidel. 2016. "Is There a Global Environmental Justice Movement?" *The Journal of Peasant Studies* 43(3): 731-755.

- Moore, Jason W. 2000. "Environmental Crises and the Metabolic Rift in the World-Historical Perspective." *Organization & Environment* 13(2): 123-158.
- _____. 2011. "Transcending the Metabolic Rift: A Theory of Crises in the Capitalist World-Ecology." *The Journal of Peasant Studies* 38(1): 1-46.
- _____. 2015. *Capitalism in the Web of Life*. New York: Verso.
- Smith, Jackie, Samantha Plummer, and Melanie M. Hughes. 2016. "Transnational Social Movements and Changing Organizational Fields in the Late Twentieth and Early Twenty-First Centuries." *Global Networks* 17(1): 3-22.
- Wallerstein, Immanuel. 1976. "Semi-Peripheral Countries and the Contemporary World Crisis." *Theory and Society* 3: 461-483. doi:10.1007/BF00161293
- _____. 1991. *Unthinking Social Science: The Limits of Nineteenth Century Paradigms*. Cambridge, UK: Polity Press.
- _____, editor. 1996. *Open the Social Sciences: Report of the Gulbenkian Commission on the Restructuring of the Social Sciences*. Stanford, CA: Stanford University Press.
- York, Richard, Eugene A. Rosa, and Thomas Dietz. 2003. "Footprints on the Earth: The Environmental Consequences of Modernity." *American Sociological Review* 68:279-300.
- _____. 2009. "A Tale of Contrasting Trends: Three Measures of the Ecological Footprint in China, India, Japan, and the United States, 1961-2003." *Journal of World-Systems Research* 15:134-146.